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Comments:
From the SCS Chief

Managing Conservation Dollars Wisely

The Soil Conservation Service has changed the way it gives its State offices money for helping landowners protect soil and water.

Under the new system, some States gain funds to meet resource needs and some States receive less. But all receive their "fair share," based on today's trends and the goals of the national conservation program.

In the past, SCS State conservationists received conservation technical assistance (CTA) funds based on how many field offices the State had. "What we got last year" became the basis for funding. This didn't reflect changing resource conditions, community needs, or State priorities.

In 1981, SCS designed a new formula for deciding how much CTA money should go to each State. It was used for the first time in fiscal year 1983.

The new formula uses 12 factors that affect most SCS activities. The first four—acres of land, number of farms and ranches, number of conservation districts, and number of people in rural areas—have historically been considered in giving States money.

The other eight factors are specific resource problems—soil erosion, flooding, irrigation, rangeland condition, surface mining, urbanization, prime farmland conversion, and animal waste disposal. In the formula, the factors are weighted to reflect the time that SCS field employees usually spend on these problems.

In all, the new system will shift about 5 percent of SCS staff resources over the next 10 years to States with more critical problems.

These changes in the distribution of CTA funds will help SCS programs operate on sound knowledge of resource problems, make hard choices on priorities, and make steadily increasing gains in the battles against soil erosion and flooding and the battle for water conservation.

Peter Myers

Cover: Furrow-irrigated corn on the Texas High Plains, where the Soil Conservation Service is targeting extra technical assistance for water conservation. See article beginning on page 3. (Photo, Donald L. Comis, assistant editor, *Soil and Water Conservation News*, SCS, Washington, D.C.)

John R. Block
Secretary of Agriculture

Peter C. Myers, Chief
Soil Conservation Service

All programs of the U.S. Department of Agriculture are available to everyone without regard to race, creed, color, sex, age, or national origin.

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Texas Counties Targeted for Ground Water Conservation

In 1983, the Soil Conservation Service began targeting extra technical assistance to help farmers in 27 Texas Panhandle counties make better use of irrigation water from the Ogallala Aquifer.

The average drop in the water table throughout the Ogallala Aquifer is 2 to 3 feet a year, and the problem is most critical in Texas and New Mexico, which have seen drops of more than 100 feet over large areas in the past 20 years.

Many wells in the High Plains of the Texas Panhandle are tapping water from the declining aquifer and every year more wells are abandoned. Dryland farming is on the increase overall, even though a few counties are increasing their irrigated acreages.

But Randy Underwood, formerly the conservation agronomist on the SCS Irrigation Water Management (IWM) team and now SCS district conservationist at Lubbock, Tex., says high energy costs, not the lowering water table, are the immediate threat to irrigation. He has seen farmers abandon weak wells after he calculated how much it cost to operate them.

The IWM team, headquartered in Amarillo, Tex., is at the center of efforts to conserve water and lower energy costs. Formed in 1978, it was the first in the Nation and now includes Jerry Walker, a civil engineer, and Fred Pringle, a soil scientist. (See article in the June 1980 issue of *Soil and Water Conservation News*.)

There are 10 million acres of cropland in the Texas High Plains, 5.8 million of those acres are irrigated. The IWM team's job is to lead SCS efforts to extend the life of the Ogallala Aquifer and to help irrigators stay in business, on suitable land.

To do this, the team has to keep one step ahead of the latest developments. Last year, for example, they started doing evaluations of surge irrigation, the first practical automation of furrow irrigation. Although it needs more research, surge irrigation is a promising technique that some farmers are already using. This year the team will train SCS field employees to evaluate water distribution with surge irrigation.

Underwood and Walker also help Pringle collect data that add to the usefulness of soil surveys. In cooperation with USDA's Agricultural Research Service (ARS) Conservation and Production Research Laboratory at Bushland, Tex., they are filling data gaps for West Texas soils with details such as the rate of water infiltration after a few hours of irrigation and the effects of compaction on irrigation efficiency.

The IWM team's expertise has attracted the attention of so many Federal, State, and local agencies that it provides an ideal nucleus for the cooperative efforts targeting depends on to stretch Federal dollars. Soon after the team was formed, the Texas Department of Water Resources, a natural gas supplier, a soil and water conservation district, and three underground water conservation districts—High Plains, North Plains, and Panhandle—added to SCS efforts.

They provided SCS with three converted horse trailers and 20 specially designed minitrailers stocked with irrigation testing equipment to serve as mobile labs. Two county governments, Hockley and Cochran, gave $1,000 each to equip one minitrailer, and other county governments and soil and water conservation districts have given additional support, paying for equipment and publicity and hosting field trips, for example.

Utility companies are installing gas meters at wells for SCS efficiency tests. Many pumps have not been serviced in 10 to 20 years and are very inefficient. Until recently, the cost of fuel wasted did not justify the cost of repairs. In other cases, the old power source is too large for the amount of water now available and should be replaced with a small electric motor which is much more efficient.

The IWM team works closely with the ARS lab at Bushland exchanging ideas among farmers, ARS, and SCS. Through cooperative studies with SCS, the lab has given SCS about $50,000 worth of personnel services and provided equipment, including a $4,000 neutron probe to measure soil moisture.

Texas A&M University at College

Randy Underwood, formerly the SCS conservation agronomist on the Texas Irrigation Water Management team and now SCS district conservationist in Lubbock, Tex., uses a neutron probe to measure soil moisture in a furrow-irrigated cornfield.

Station, Tex., Texas Tech University at Lubbock, the Texas Agricultural Extension Service, and the Texas Agricultural Experiment Stations at Amarillo, Halfway, and Lubbock, also help with field days and cooperative studies.

Last fiscal year, the Texas ground water depletion area received $175,000 in SCS targeting funds, in addition to usual SCS funding. This fiscal year, they received $565,000. The SCS money is used for personnel and equipment needed for water conservation efforts.

Working in partnership with SCS, USDA's Agricultural Stabilization and Conservation Service (ASCS) provides some of these counties additional cost-share money for targeting efforts. The best example is the Swisher County ASCS office which received $141,000 in additional cost sharing in fiscal year 1983, and used it to help 125 farmers pay part of the costs of irrigation improvements such as replacing deteriorated pipelines and connecting several wells to get water at a lower cost.

Farmers in Swisher County and elsewhere also used the cost-share funds to install pits to recover excess irrigation water, known as tailwater, as it leaves the fields. These tailwater pits increase the overall efficiency of an irrigation system by 20 percent.

Farmers are saving energy and water in many other ways, too, including irrigation scheduling, fewer irrigations per season, moisture monitors, reduced seeding rates, and conservation tillage. Many are switching to more water-efficient crops, dropping corn in favor of wheat or grain sorghum.

SCS personnel in Swisher County tested more than 60 wells last year. Their evaluations involve checking the fuel efficiencies of pump motors and the water efficiencies of entire systems, including the land's suitability for irrigation. The Tule Creek Soil and Water Conservation District (SWCD) bought most of the testing equipment, with some of the money raised locally—including part of their $200-a-month allotment from the county—and matching funds from the State.

Funds from a contract with the Texas Department of Water Resources enabled the Tule Creek SWCD to purchase some equipment. The Swisher Electric Cooperative, along with the county extension agent and ARS, sponsors energy and water conservation field days. Private firms donate irrigation equipment to the Tule Creek SWCD for demonstrations.

Tom Davey, SCS district conservationist in Swisher County, says the biggest push in the county is to convert land with excessive slope to dryland farming because this land wastes too much water. In 20 years, the number of irrigated acres in Swisher County has declined from 300,000 to 180,000. With a total of 400,000 cropland acres, dryland acres now exceed irrigated acres.

During fiscal year 1983, SCS technical assistance throughout the Texas ground water target area has resulted in 53,089 acre-feet of water savings, more than 17 billion gallons, on 208,068 acres. There was an average 10 percent overall efficiency improvement in water use on 96,190 of those acres.

Each percentage of improvement means a lot of dollars in savings to farmers. That is why SCS services are in such demand.

Donald L. Comls,
assistant editor, *Soil and Water Conservation News,* SCS, Washington, D.C.

SCS District Conservationist Randy Underwood checks recording device on a flume that measures the flow of tailwater from a furrow-irrigated field.

A Tule Creek Soil and Water Conservation District supervisor examines an irrigation pump during an efficiency test at a field day sponsored by SCS and the Swisher County Extension Service.

Conservation Highlights 1983

Summary of Activities
of the Soil Conservation Service
for Fiscal Year 1983

The new National Program for Soil and Water Conservation adopted by the U.S. Department of Agriculture (USDA) gives priority to reducing excessive soil erosion on crop, range, pasture, and forest lands; conserving water used in agriculture; and reducing upstream flood damages. These priorities, developed by USDA in response to the Soil and Water Resources Conservation Act of 1977, guided the Soil Conservation Service as it carried out its programs for protecting and developing the Nation's soil, water, and related resources in fiscal year 1983.

Conservation Tillage
Out of the 277.9 million acres planted to crops in 1983, farmers used some form of conservation tillage on nearly 87 million acres, reports the National Association of Conservation Districts' Conservation Tillage Information Center. Conservation tillage is any tillage or planting system that retains at least 30 percent residue cover on the soil surface.

Farmers used no-till, a conservation tillage method in which only a narrow seedbed is disturbed for planting, on 10.1 million acres.

SCS officials and technical specialists participated in many conservation tillage field days, demonstrations, and seminars during the year to promote these soil-saving practices.

Targeting
By targeting funds and people to the Nation's most serious natural resource problems, SCS, Agricultural Stabilization and Conservation Service (ASCS), and other USDA agencies helped to reduce soil erosion and save water in 31 States. During 1983, the program's second full year, farmers and ranchers reduced soil erosion in targeted areas by nearly 29 million tons and water losses by 276,000 acre-feet through increased application of soil conservation and water management.

Agricultural Conservation Program
Through the Agricultural Conservation Program (ACP), SCS provided technical assistance to 10,000 farmers and ranchers who installed enduring conservation practices on their land through long-term agreements. Under ACP, 750,000 acres benefited from irrigation water conservation measures and 512,600 acres benefited from terrace systems. Farmers also applied conservation tillage to 918,000 acres. ASCS administers ACP and provides financial assistance to landowners.

SCS provided soil loss data to ASCS in 126 counties to determine where the most severe soil erosion was occurring. Based on the data, ASCS determines who should receive cost sharing under the agency's variable cost-share program.

Great Plains Conservation Program
In the 10 Great Plains States, 975 farmers and ranchers signed long-term contracts to apply permanent conservation measures on 2.7 million acres, bringing the acreage to date under Great Plains Conservation Program (GPCP) contracts to 117 million. Farmers completed 1,776 contracts on 4.4 million acres.

Through GPCP, SCS provides technical assistance and cost sharing to landowners to minimize the hazards of recurring drought and wind and water erosion.

Rural Abandoned Mine Program
SCS administers the Rural Abandoned Mine Program (RAMP), authorized by Section 406 of the Surface Mining Control and Reclamation Act. Through RAMP, SCS provides technical and financial assistance to land users in reclaiming soil and water resources on rural lands adversely affected by past coal mining. By the close of fiscal year 1983, the program's sixth year, 324 contracts obligating $34.7 million had been signed. Conservation work done under these contracts reduced soil erosion by 313,000 tons, eliminated 616 safety and health hazards, and improved water quality in 50,500 acres of lakes and 178 miles of streams.

Soil Research
SCS supported ongoing research at North Carolina State University and Auburn University in Alabama to relate specific soil properties of eroding soils to losses in crop yields.

SCS also worked on an interagency team with USDA's Agricultural Research Service (ARS) and Economic Research Service and Texas A&M University on developing an Erosion Productivity Impact Calculator (EPIC). EPIC is a process computer model with soil erosion, weather, plant growth, and other components designed to determine the relationship between soil erosion and productivity.

Soil Moisture Monitoring
This was the fourth year that SCS monitored eight soil moisture measurement sites in the United States. Specialists take weekly measurements at the sites by 6-inch increments to a depth of 6 feet during the growing season. The data collected at the sites are being stored at the National Soil Survey Laboratory in Lincoln, Nebr., and will be useful in irrigation scheduling, dryland farming, and soil classification.

AgRISTARS
In the third year of a 6-year research program—Agriculture and Resources Inventory Surveys Through Aerospace Remote Sensing (AgRISTARS)—USDA and four other Federal agencies continued work on developing methods of forecasting crop production and inventorying renewable resources. SCS is leading the development and testing of a mobile device which uses the principle of nuclear magnetic reasonance to measure soil water content in the surface 6 inches.

Soil Surveys
In fiscal year 1983, 60 soil surveys were published and 61 survey manuscripts with maps were sent to be printed. More than 46 million acres were mapped during the year.

Colorado River Basin Salinity Control Program
In the Arizona Wellton-Mohawk salinity control project, with financial assistance provided by the U.S. Department of the Interior's Bureau of Reclamation, SCS has treated a total of 27,200 acres. Average onfarm irrigation efficiencies have been raised from 55 percent to 80 percent, substantially reducing saline return flows to the Colorado River.

Projects in the Uinta Basin, Utah, and Grand Valley, Colo., have reduced the total annual salt load to the Colorado River by about 41,000 tons. SCS provides technical assistance on these projects and ASCS provides cost sharing funds. Also cooperating are the Extension Service, ARS, and the Bureau of Reclamation.

Small Watershed Projects
SCS began construction on 21 new Public Law–566 small watershed projects in 1983, approved planning for 25 projects, authorized installation of 22 projects, and completed construction on or closed out 21 projects.

Small watershed projects combine conservation measures and structural and nonstructural measures to reduce flood damage and provide agricultural water management, municipal and industrial water, recreation, and wildlife habitat.

Emergency Assistance
Under Section 403 of the Agricultural Credit Act of 1978, SCS obligated an estimated $9.4 million in watershed emergency assistance to help California, Mississippi, Arkansas, Utah, Connecticut, and other States repair damage caused by floods and other natural disasters.

Emergency Jobs Act
Funds made available under the 1983 Emergency Jobs Act (Public Law 98–8) enabled SCS to fund additional watershed, flood prevention, emergency watershed protection, and resource conservation and development measures. SCS obligated about $52 million to fund 614 measures in high unemployment areas in 44 States.

Resource Conservation and Development Areas
In fiscal year 1983, work continued in the 194 areas authorized for assistance under the Resource Conservation and Development program. SCS administers the program to help conserve and improve the use of land, develop natural resources, and improve and enhance social, economic, and environmental conditions in rural areas.

River Basin Studies
SCS leads USDA cooperation with other Federal, State, and local agencies in making investigations and surveys of river basins to guide the development of water and related land resources in agricultural, rural, and upstream watersheds. In 1983, 45 river basin studies were in progress in 34 States and 4 were completed.

Flood Plain Management
Under Section 6 of Public Law 83–566, SCS completed nine flood plain management studies and one reimbursable flood insurance study in 1983. The studies include data on natural and beneficial values served by flood plains and on management alternatives. Local units of government use this information to develop, adopt, implement, and amend flood plain management programs.

Resource Inventories
The fieldwork for the 1982 National Resources Inventory (NRI) was completed in fiscal year 1982. Preliminary NRI data were released in 1983, and the final data will be released in 1984.

Important Farmland Inventory
As authorized by Section 302 of the Rural Development Act of 1972, SCS leads USDA efforts for inventorying the Nation's prime agricultural areas. By the end of fiscal year 1983, SCS had published important farmland maps, which delineate prime and unique farmland, for 910 counties. Another 374 maps are nearly completed.

Cartography and Geographic Information Systems
Under its National High Altitude Photography program, SCS, in cooperation with the U.S. Geological Survey and other Federal agencies, continued to award contracts for infrared and black and white aerial photographs now covering 94 percent of the continental United States. SCS has begun to develop a manual for use in testing current remote sensing technology and applications to support the National Resources Inventory and other resources assessments.

Rural Development
Through State and local Food and Agriculture Councils, SCS cooperated with many others to improve program delivery in rural development.

In fiscal year 1983, SCS assisted 29,165 units of government in rural communities to control flooding, reduce roadside erosion, improve the landscape, and preserve historical and cultural resources. Many private citizens volunteered their time and talents to carry out these activities. As a result, communities gained rural, municipal, and industrial water supplies; irrigation water; and recreation areas.

With other USDA agencies and the Rural Governments Coalition, SCS conducted rural development workshops for locally elected officials. SCS also assisted with USDA's small and family farm resource development initiative, various small farm projects, and special conservation projects.

Volunteers
More than 600 volunteers, of all ages, donated 68,000 hours in 1983 to help SCS with soil and water conservation. Their time, most of it spent in field tasks, is valued at more than half a million dollars.

Engineering
SCS revised two major engineering computer programs, which include an improved procedure for routing floodwaters and updated criteria for dam design and farm ponds. SCS also worked on developing a computer drafting system that can automatically produce drawings of sections of reinforced concrete structures for water control. In cooperation with ARS scientists, SCS engineering and environmental specialists continue to work on a water quality model—CREAMS (Chemicals, Runoff, and Erosion from Agricultural Management Systems)—for use in assessing the effectiveness of conservation systems in reducing pollutants in runoff. SCS published a national handbook on furrow irrigation and a technical guide to landscape design for reclaiming mined land.

Water Quality Management Plans
Water quality management planning under Section 205 of the Clean Water Act has been expanded to include ground water activities specified in pending Environmental Protection Agency (EPA) policy. SCS will continue to support EPA's efforts to solve water quality problems in rural America for both surface and subsurface sources.

Rural Clean Water Program
SCS provided technical assistance in developing 1,532 water quality plans. By the end of fiscal year 1983, SCS had signed contracts with 1,214 individuals to protect water quality by applying conservation on 174,000 acres. ASCS provided $20 million in financial assistance.

Conservation Education
To help make teenagers aware of soil as a fundamental natural resource, SCS published *Conserving Soil*, a book of teaching materials for grades 6 through 9. Educators nationwide have described the publication as excellent. SCS has begun working on a similar book for the lower elementary grades.

Snow Surveys
Through its Snow Telemetry System (SNOTEL), SCS collected snowpack information at 489 automatic data collection sites in the Rocky Mountain area. SCS also issued more than 3,500 water supply forecasts used by municipal water authorities, irrigation companies, and individuals.

In spring 1983, snow survey and water supply forecasts helped western reservoir operators avoid some flooding caused by record snow packs and record temperatures that melted snow rapidly at high elevations.

Range
SCS continued to develop automatic data storage and retrieval programs to help ranchers evaluate the economic effects of range management practices and programs on their operations.

Windbreaks
SCS assisted with planting an estimated 2,200 miles of field windbreaks in 1983 to protect cropland from wind erosion and provide wildlife habitat. The agency also assisted landowners with planting farmstead and feedlot windbreaks to save energy.

Fish and Wildlife
SCS helped land users improve wildlife habitat on half a million acres of wetland and 10 million acres of upland areas, assisted with wildlife water facilities in water-short areas benefiting wildlife on 50,000 acres, and helped land users manage nearly 20,000 fishponds. SCS also continued monitoring the effects of soil erosion reduction practices on fish and wildlife habitat, as well as the effects of farm commodity programs.

Plant Materials
SCS plant materials centers released 11 conservation plants in 1983. The releases include seven grasses for forage adapted to different parts of the country; a legume for forage, wildlife food, and erosion control; and three shrubs—one for stabilizing streambanks, one for providing ground cover, and one for providing food and cover for wildlife.

Cultural Resources Activities
SCS received a $15,000 grant from the National Geographic Society for recovering artifacts at a significant archeological site at Pilcher Creek Dam and Reservoir in Union County, Oreg. SCS also established new procedures for protecting cultural resources and saved three National Historic Landmarks from soil erosion.

Sociological Assessments
Work continued on cooperative research with two State land-grant universities to determine how farmers perceive conservation and what most influences them to adopt soil and water conservation practices. Preliminary data from one study indicate that many land users need help in identifying soil erosion problems on their own land. Other studies are being made to determine what socioeconomic factors influence landowners' adoption of conservation systems.

During the year, SCS reviewed 17 final and 6 draft water resource plans to evaluate the social impacts on affected communities and households.

Farmland Protection
From individuals and organizations, SCS received 150 comments on draft rules for implementing the Farmland Protection Policy Act of 1981. The rule contains criteria for use by all Federal agencies to avoid unnecessary conversion of farmland to other uses.

In 1983, many States and hundreds of counties worked on adapting a computerized Land Evaluation and Site Assessment system developed by SCS to determine which lands should be set aside for agriculture and how to rate them.

Information Resources Management

In the future, all SCS employees will be using computers in their daily work. The Information Resources Management (IRM) Division was formed in 1983 to help agency personnel make the transition to high technology.

Reform 88

SCS made cost-saving improvements under Reform 88—an initiative to streamline management throughout the Federal Government—in several areas including travel, training, mail, motor vehicles, personnel, space, and paperwork.

International Activities

In 1983, SCS continued work with the Agency for International Development and international organizations through USDA's Office of International Cooperation and Development. SCS responded to requests for technical assistance by assigning 181 staff members to 45 different countries. The employees were also involved in scientific and technical exchanges. SCS hosted 156 representatives from 36 countries who studied our conservation programs and carried adaptable methods back to their own countries.

Summary of Progress Fiscal Year 1983

Reportable progress in soil and water conservation programs assisted by the Soil Conservation Service.

Progress Item		Fiscal Year 1983	Cumulative to Sept. 30, 1983
Long-term Contracts			
Unserviced applications			
GPCP	No.	—	4,495
	acres	—	12,108,947
RAMP	No.	—	2,807
	acres	—	85,545
Watershed protection and flood prevention	No.	—	680
	acres	—	125,391
Contracts signed			
GPCP	No.	975	60,608
	acres	2,669,236	116,780,931
RAMP	No.	—	324
	acres	—	6,209
Watershed protection and flood prevention	No.	710	4,027
	acres	104,931	609,479
Contracts completed or terminated			
GPCP	No.	1,776	52,960
	acres	4,379,019	94,271,525
RAMP	No.	—	—
	acres	—	—
Watershed protection and flood prevention	No.	368	2,168
	acres	45,526	416,083
Resource Conservation and Development Areas			
Applications on hand	No.	47	241
	acres	209,964,000	1,057,868,000
Areas authorized for assistance	No.	—	194
	acres	—	847,904,000
RC&D measures completed	No.	1,750	19,884

Progress Item		Fiscal Year 1983	Cumulative to Sept. 30, 1983
Conservation Plans and Related Services			
District cooperators	No.	50,719	2,259,034
	acres	25,012,309	857,501,086
Individuals and groups assisted	No.	943,301	—
Technical services to land users	No.	2,300,819	—
Individuals and groups applying practices	No.	462,313	—
Conservation plans	acres	37,302,193	652,841,993
Conservation Help for Units of Government			
Technical services for area planning	No.	110,109	—
Land use and treatment site plan reviews	No.	26,588	—
Units of government assisted	No.	29,165	—
Soil Surveys			
Soil surveys	acres	41,536,806	1,707,811,477

Land Adequately Protected by Conservation Practices		
Cropland	acres	13,613,063
Pasture and hayland	acres	5,233,253
Range and native pasture	acres	29,399,780
Forest land	acres	1,680,333
Wildlife land	acres	2,464,379
Recreation land	acres	173,582
Other land	acres	206,552
Total Land Protected	acres	52,770,942

Plant Materials

SCS Releases 11 Conservation Plants

A brilliantly colored sumac shrub for ground cover and a flexible willow for streambank stabilization are among the 11 conservation plants released by the Soil Conservation Service and cooperating agencies in 1983. The releases also included a nut-bearing shrub for wildlife food and cover, seven grasses for forage adapted to different sections of the country, and a legume for forage, wildlife food, and erosion control.

The sumac shrub, 'Autumn Amber' skunkbush sumac *(Rhus trilobata)*, was released by the New Mexico State University Agricultural Experiment Station and the SCS Los Lunas Plant Materials Center (PMC) in Los Lunas, N. Mex. It is a low-growing shrub whose leaves turn brilliant reds and yellows after frost in the fall. Its low growth form makes it an excellent ground cover especially where erosion control is needed. Its attractive fall colors make it useful in recreation beautification plantings.

Sideoats grama

Without irrigation, Autumn Amber grows best when planted in areas receiving 12 to 14 inches of precipitation a year. With irrigation, it is adapted throughout the Western States.

The University of Kentucky Agricultural Experiment Station and the SCS PMC in Quicksand, Ky., released 'Bankers' dwarf willow (*Salix cotteti* Korner), which is best suited to stabilizing banks of streams where the velocity does not exceed 6 to 8 feet per second. Its low growth and small stem diameter allow it to bend with the velocity of the water. Because of this, debris is less likely to be trapped by the plant, which reduces the likelihood that debris will dislodge the plant from the bank.

It is readily propagated from cuttings that can be planted onto the streambank either as rooted cuttings or as unrooted cuttings. Its growth rate is rapid. Growth is best on wet sites subject to periodic flooding and overflow. The plant competes well with grass and weed species. This permits the use of herbaceous species for temporary stabilization during the early development stages of the willow.

Bankers is adapted from Pennsylvania south to Alabama and in Oregon and Washington west of the Cascade Range.

The University of Kentucky Agricultural Experiment Station and the SCS PMC in Quicksand also released the nut-bearing shrub for wildlife food and cover. Named 'Golden' chinquapin *(Castanea pumila)*, it produces a smaller nut than the American chestnut, approximately ½ inch in diameter, which provides an excellent source of wildlife food during fall and winter. The nuts are eaten by squirrel, deer, grouse, bobwhite quail, and wild turkey, as well as by humans.

It is a large shrub, growing to a maximum height of 15 to 20 feet, and is native to the Eastern United States. It is adapted to a wide range of site conditions, including those that are dry, well drained, moist, sunny, or shady. It can be grown on sandy loam soils or clay soils. Ideally, it should be planted where competition from other plants is slight. Its known geographic range is southern Georgia to Texas and north to New Jersey, southern Pennsylvania, Ohio, Indiana, Illinois, Missouri, and most of Arkansas.

The following seven grasses and one legume make up the rest of the 1983 releases:

- 'Salado' alkali sacaton *(Sporobolus airoides)* is a perennial warm season native bunchgrass adapted to moderately saline and alkaline soils. It provides good forage and ground cover and is adapted on light to heavy textured soils. It is useful for range improvement, mined land reclamation, highway revegetation, and forage production on most of the arid lands in the West. It was released by the New Mexico State University Agricultural Experiment Station and SCS Los Lunas PMC, Los Lunas, N. Mex.
- 'Paiute' orchardgrass *(Dactylis glomerata)* is a cool season, shade-tolerant, long-lived bunchgrass developed as a forage crop for arid rangelands. It can be used for erosion control, firebreaks, and critical area treatment. In comparison with standard crested wheatgrass, Paiute greens up a week to 10 days earlier in the spring, remains green longer, responds quicker to fall rains, and is the preferred species for livestock and wildlife. It persists in areas down to 11 inches of annual precipitation. Throughout the Intermountain West, it has done well on well-drained, basic to slightly acidic soils ranging from clay to gravelly loam and from shallow to deep. It is best adapted to sagebrush-grass and pinyon-juniper communities.

Paiute was released by USDA's Forest Service Intermountain Forest and Range Experiment Station; Utah State Division of Wildlife Resources; the Agricultural Experiment Stations of the University of Arizona, University of Idaho, New Mexico State University, and Utah State University; and SCS.

- 'Ephraim' crested wheatgrass *(Agropyron cristatum)* is rhizomatous and has shown good characteristics primarily for stabilization of disturbed sites, critical area stabilization, and erosion control. It is equal to standard crested

wheatgrass for range forage. It will grow and produce adequate forage with 8 inches annual precipitation but does best with between 10 and 14 inches. It is adapted to a wide range of soils, including disturbed areas and mine spoils. Salt and alkali tolerance is moderately high. It is adapted to northern Arizona, Utah, Idaho, and Montana.

Ephraim was released by USDA's Forest Service Intermountain Forest and Range Experiment Station; Utah State Division of Wildlife Resources; the Agricultural Experiment Stations of Utah State, Arizona, and Idaho Universities; and SCS.

- 'Rumsey' indiangrass *(Sorghastrum nutans)* and 'Rountree' big bluestem *(Andropogon gerardii)* are both tall, warm season perennial native grasses useful for livestock forage production in the Corn Belt States. Warm season grasses such as big bluestem and indiangrass grow rapidly during the summer months and are at their most nutritious stage when cool season grasses are dormant or semidormant. The inclusion of these species in the total forage program can improve animal performance during the summer and increase overall production, while providing improved erosion control on pasture land.

Rumsey and Rountree are also useful for wildlife cover, used extensively as ground nesting cover and as excellent brood rearing areas for quail, pheasant, and several nongame songbirds. They can be used in establishing native grass areas to display an original native prairie in parks and wildlife preserves. They are adapted to Missouri, Iowa, Illinois, southern Minnesota and Wisconsin, as well as eastern Kansas, Nebraska, and South Dakota.

Rumsey and Rountree were released by the University of Missouri Agricultural Experiment Station and the SCS Elsberry PMC, Elsberry, Mo.

- 'Rodan' western wheatgrass *(Agropyron smithii)* is an aggressive sodforming native grass useful in range seedings, surface mine reclamation, and critical area stabilization. It is best adapted to a mean annual precipitation of 14 to 20 inches but performs well in the 10- to 14-inch zone. It is best adapted to soils that are silt or clay but performs satisfactorily on sandy soils. It tolerates soils that are weakly basic to strongly saline. Rodan was selected for superior performance in the northern Great Plains.

Rodan was released by USDA's Agricultural Research Service, the North Dakota State University Agricultural Experiment Station, and the SCS PMC in Bismarck, N. Dak.

- 'Haskell' sideoats grama *(Bouteloua curtipendula)* is a strong perennial forage plant with excellent seedling vigor. It establishes easily, is drought hardy, and maintains its green growth longer than most commercial types in times of stress. It prefers medium texture soil and responds exceptionally well to fertilization. It has performed well in most areas of Texas where the average annual precipitation is 18 inches or greater.

Haskell's advantages over presently available cultivars are improved adaptation, exceptional rhizome production that aids in controlling erosion, and equal and superior forage and seed production.

Haskell was released by USDA's Agricultural Research Service, Texas Agricultural Experiment Station of Texas A&M University, and SCS PMC, Knox City, Tex.

- 'Sabine' illinois bundleflower *(Desmanthus illinoensis)* is a legume useful for range and pasture seeding mixtures and for wildlife food. It is excellent for use in mixtures on eroding sites. It is hardy from southern Texas to northern Oklahoma, winter hardy, drought resistant, and readily eaten by all types of livestock and wildlife. It frequently grows on clay soils, and grows well on soils through sandy loam textures. It appears best adapted for planting mixtures in Texas on areas receiving 20 inches or greater annual rainfall.

Sabine was released by USDA's Agricultural Research Service, Texas Agricultural Experiment Station of Texas A&M University, Texas Parks and Wildlife Department, and SCS PMC, Knox City, Tex.

Seed Cleaning Technique Means Wider Use for Warm Season Grasses

The resurgence of interest and use of warm season grasses in the U.S. Corn Belt could present seed-handling problems. The grass species being used most are switchgrass (*Panicum virgatum* L.), big bluestem (*Andropogon gerardii* Vitman), and indiangrass *(Sorghastrum nutans)*.

Although switchgrass presents no seeding problems, indiangrass and big bluestem present enormous problems with seed flow.

Both indiangrass and big bluestem seed have awns and hairlike appendages ranging from 1 to 2 centimeters long. These appendages cause difficulty in separating seed from other plant parts during harvesting and cleaning. This separation problem worsens during the seeding operation as the seeds become entangled and fail to flow through seeding equipment commonly used in the Corn Belt. This problem in handling big bluestem and indiangrass seed greatly reduces their acceptability as grass species for use in a pasture forage system.

The Soil Conservation Service Plant Materials Center at Elsberry, Mo., has developed a seed cleaning technique which has resulted in the successful removal of awns, hairlike appendages, and foreign matter from the seed. This is accomplished by using a debearder and fanning mill, which significantly increases seed quality. The mixing action of the debearder rubs or breaks off awns and other seed appendages and increases separation of seed from other plant parts in the seed cleaner.

Indiangrass seed processed with the debearder fanning mill tested at 98 percent purity and 83 percent germination. A 4-year average purity was 94.1 percent and germination was 61.5 percent with 57.9 percent pure live seed (PLS). For the big bluestem, the 4-year purity was 92.5 percent and germination was 70.3 percent, with 65.0 percent PLS. The present standards of the Association of Official Seed Certifying Agencies for cer-

tifying big bluestem and indiangrass require only 25 percent PLS. Many commercial seedlots contain 25 to 30 percent PLS.

Not only are the seed handling characteristics greatly improved, but also the bulk density of the seed is increased approximately three times with the debearder fanning mill system. This more tightly packed seed could make a critical difference if storage space is limited and offers a tremendous advantage in shipping.

Seed processed with the debearder fanning mill can easily be planted with a grain drill, packer seeder, broadcast equipment, or any equipment designed to seed grass, eliminating the need for expensive specialized seeders.

Once commercial producers are geared up for the debearder fanning mill processed seed, the availability of this seed should enhance the use of these species for forage production in the Corn Belt States.

Jimmy Henry,
manager, Plant Materials Center,
SCS, Elsberry, Mo.

Four Grasses Star in California's Fight Against Erosion

From more than 25,000 plants tested at the Soil Conservation Service Plant Materials Center in Lockeford, Calif., over the past four decades, a select 16 have emerged with rave reviews for fighting erosion in the country's most populous State.

Of the 16, 'Blando' brome and 'Zorro' annual fescue are the superstars. These two reseeding annuals establish quickly after rains and are well adapted to the cool, wet winters and hot, dry summers of California.

SCS plant scientists are trying to expand use of the grasses from critically eroded rangeland to cover crops and waterways. Such quick, reliable cover is greatly reducing erosion and flood damage.

In a Kern County annual field planting review, the two grasses planted on gently rolling orchard land had improved soil condition, controlled runoff, increased intake rates, and greatly reduced erosion.

Zorro annual fescue will not aggressively invade cropland and, according to SCS Area Agronomist Clarence Finch, "it provides a quick fix on bare, eroding land, but can be easily controlled by herbicide." Blando brome reseeds well, but needs more fertile soil and better management for lasting cover.

With careful mowing, both will set seed when they are 3 to 4 inches high, and Zorro can be cut down to the shorter cover needed for convenient ground harvesting of nut orchards.

Two varieties of sterile hybrid bermudagrass—'Santa Ana' and 'Tufcote'—are also undergoing tests in field plantings on critical area waterways, gullies, and citrus orchards. Originally developed as turf grasses, both are used as lawn in southern California and are now under scrutiny for soil conservation use.

At the Kern County trials, Santa Ana appeared to be establishing a thicker and shorter sod than Tufcote, but both survived the seasonal lack of moisture on the water courses. In tests around the State, Tufcote seems to be doing well on eroded pond banks, where it quickly and aggressively provides a low protective cover.

Since the four grasses require different management than the crops they protect, farmers need to know about the grasses' particular needs, according to Finch. This is being accomplished through a widespread field testing program where farmers can see these plants in action, he said.

Marilyn Guelden,
public affairs specialist, SCS, Davis, Calif.

State School Residents Harvest Seed for Plant Materials Program

The selection and release of conservation plants and the progressive training of mentally handicapped Texas State School residents are usually not thought of as being connected; however, these two programs have gone hand-in-hand for the last 5 years.

Under a cooperative agreement between the Abilene State School, the Middle Clear Fork Soil and Water Conservation District, and the Soil Conservation Service, seeds from a number of difficult-to-harvest native forb, shrub, and tree species are grown in an orchard-type planting at the State School. The seed, needed for range reseeding and wildlife, is then hand harvested by the State School residents. (See article in the December 1979 issue of *Soil Conservation.*)

According to Walt Driesner of the State School staff, "The State School residents in the training program have harvested more than 1,000 pounds of native forb, shrub, and tree seed since 1979.

"The harvesting is an excellent training method which combines such things as hand-eye coordination, work habits, and attention span, in addition to providing fresh air and sunshine."

More than 100 students have been exposed to the training since the program began. Some have progressed from being unable to do any productive tasks, through pretraining, on to the highest work level at the school.

The cooperative effort has resulted in the release of 'Yellow Puff' littleleaf leadtree, a woody, leguminous small tree for use in range, wildlife, and ornamental plantings. In 1982, 211 pounds of Yellow Puff seed was harvested by the State School residents and made available to growers for commercial production.

Kenneth L. Cash,
district conservationist, SCS, Abilene, Tex.

David Lorenz,
formerly manager, J. E. "Bud" Smith Plant Materials Center, SCS, Knox City, Tex.; now plant materials specialist, SCS, Harrisburg, Pa.

NACD 38th Convention Features Stamp Issue, Awards to Lawmakers

Celebration of the 50th anniversary of soil and water conservation began with a flourish at the 38th annual convention of the National Association of Conservation Districts (NACD), held February 5–9, 1984, in Denver, Colo.

A highlight was a February 6 "first day" ceremony to issue a 20-cent U.S. postage stamp honoring soil and water conservation. In presenting souvenir sheets of the stamp to conservation leaders, James V. Jellison, senior assistant postmaster general, congratulated delegates for their "collective efforts" to protect soil and water.

"Your work," he said, "has saved billions of tons of soil... it has improved the quality of the country's water supply ... it has helped create new recreational opportunities... it has reduced the fear of floods... and, perhaps most importantly, it has provided opportunities for young Americans to remain on the land."

Responding to the presentation, Soil Conservation Service Chief Peter C. Myers said the stamp will serve to remind Americans "not only of what has been accomplished in the last 50 years, but also of the important work that remains to be done."

Following the ceremony, a temporary post office in the lobby of the convention hotel sold thousands of conservation stamps and "first day covers" to delegates. NACD also displayed its own souvenirs to mark the 50th anniversary, and SCS unveiled a new traveling exhibit marking 50 years of soil and water conservation.

NACD presented two 1984 Distinguished Service Awards. One went to Senator Roger W. Jepsen of Iowa, chairman of the Senate agriculture subcommittee on soil and water conservation, forestry, and environment. The other was awarded to Representative Ed Jones of Tennessee's 8th district. Jones is chairman of the House agriculture subcommittee on conservation, credit, and rural development. Both legislators accepted their awards in person.

Speaking at a convention luncheon, Colorado's Governor Richard D. Lamm warned delegates that "farmland is disappearing at a rate causing international alarm."

He observed that "most of the poor peoples of the Earth are poor mainly because their ancestors wasted the natural resources on which present generations must live."

If this country is to maintain its food producing capability, Lamm said, "it will have to take action to prevent the deterioration of its soil base."

NACD President Milton E. "Bud" Mekelburg, who was elected to a second term, promised to work toward "new commodity programs and new methods of administering current programs which will encourage farmers and ranchers to apply sound conservation methods."

Like several other speakers, Mekelburg gave strong support to passage of the "sodbuster" bill of Colorado Senator William Armstrong, a measure which would deny participation in U.S. Department of Agriculture commodity programs to farmers who plow up highly erodible land to plant crops.

An NACD Special Recognition Award went to New Mexico's Philmont Scout Ranch for its active support of conservation education. Other awards were made for communications, business conservation leadership, professional service, and special service.

About 1,500 people registered for the convention.

Hubert W. Kelley, Jr.,
director, Public Information, SCS,
Washington, D.C.

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